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EXAMINER	
ERDEM, FAZLI	
ART UNIT	**PAPER NUMBER**
2826	

NOTIFICATION DATE	DELIVERY MODE
02/04/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspto@ti.com

Office Action Summary	Application No.	Applicant(s)	
	10/722,013	LU ET AL.	
	Examiner	Art Unit	
	FAZLI ERDEM	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 December 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-5,7-10 and 12-21* is/are pending in the application.

4a) Of the above claim(s) *9,10 and 12-18* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-5, 7, 8 and 19-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant argues that 35 USC 103 rejection sent out on final rejection on 10/30/2008 was a new 35 USC 103 rejection, and hence cannot be used to make a final rejection. However, 103 rejection sent out on 10/30/2008 was not a new 35 USC 103 rejection. It first appeared on the non-final rejection 4/1/2008. Due to a clerical error, the portion of the non-final rejection sent out of 4/1/2008 that included the 35 USC 103 rejection was not sent to the applicant in full form. Examiner sends out the missing portion of non-final rejection sent out on 4/1/2008 with 35 USC 103 included and makes this rejection another final rejection.

2. On remarks filed on 12/22/2008, applicant argues that recrystallized polysilicon is structurally different than as-deposited/standard polysilicon and brings in a reference which shows a specific method of making polysilicon/recrystallized polysilicon. However, Figs. 15.1, 15.2 and pages 15.3-15.5 of the "The MEMS Handbook" reference submitted on these remarks, disclose a one particular method of making polysilicon/recrystallized polysilicon under a specific deposition conditions. There are other deposition/manufacturing conditions that would result in different grain size and surface roughness for polysilicon/recrystallized polysilion end product. On page 8 of the remarks submitted on 12/22/2008, applicant argues that: "Polysilicon is made up of small single- crystal domains called grain whose orientations and/or alignment vary with respect to each other. The roughness often observed on polysilicon surfaces is due to the granular nature of polysilicon. The microstructure of the as-deposited polysilicon is a function of the

deposition conditions." This is true for what applicant calls "as deposited/standard polysilicon" as well as "recrystallized polysilicon". Furthermore, on the same page applicant brings out one type of crystallization/deposition LPCVD under specific conditions. However, there are other crystallization/deposition methods under different specific conditions. Therefore, applicant has not produced evidence that all methods under all specific conditions produces a materially/structurally different product for what applicant calls "recrystallized" polysilicion and the end product of them are materially different than what applicant calls "standard/as deposited" polysilicon. Under the MPEP guidelines examiner must give broadest meaning to the claim in question. Therefore, examiner still considers the "recrystallized polysilicon" to be materially/structurally no different than what applicant calls "as deposited/standard" polysilicon. Applicant did not present evidence that shows for all crystallization/deposition methods under all conditions "recrystallized" polysilicon is different than "as deposited"/"standard" polysilicon.

2111 Claim Interpretation; Broadest Reasonable Interpretation [R-5] - 2100 Patentability

2111 Claim Interpretation; Broadest Reasonable Interpretation [R-5]

CLAIMS MUST BE GIVEN THEIR BROADEST REASONABLE INTERPRETATION

During patent examination, the pending claims must be "given their broadest reasonable interpretation consistent with the specification." >The Federal Circuit's *en banc* decision in *Phillips v. AWH Corp.*, 415 F.3d 1303, 75 USPQ2d 1321 (Fed. Cir. 2005) expressly recognized that the USPTO employs the "broadest reasonable interpretation" standard:

The Patent and Trademark Office ("PTO") determines the scope of claims in patent applications not solely on the basis of the claim language, but upon giving claims their broadest reasonable construction "in light of the specification as it would be interpreted by one of ordinary skill in the art." *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364[, 70 USPQ2d 1827] (Fed. Cir. 2004). Indeed, the rules of the PTO require that

application claims must "conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description." 37 CFR 1.75(d)(1).

The broadest reasonable interpretation of the claims must also be consistent with the interpretation that those skilled in the art would reach. *In re Cortright*, 165 F.3d 1353, 1359, 49 USPQ2d 1464, 1468 (Fed. Cir. 1999) (The Board's construction of the claim limitation "restore hair growth" as requiring the hair to be returned to its original state was held to be an incorrect interpretation of the limitation. The court held that, consistent with applicant's disclosure and the disclosure of three patents from analogous arts using the same phrase to require only some increase in hair growth, one of ordinary skill would construe "restore hair growth" to mean that the claimed method increases the amount of hair grown on the scalp, but does not necessarily produce a full head of hair.)

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 2 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Jung (6,204,105).

Regarding Claim 2, in Fig. 2l Jung discloses a semiconductor device, comprising: a first polysilicon layer 24b located over a gate electrode layer 34; and a capacitor located 34/29/34 on said first polysilicon layer 24b over said gate electrode layer 34, said capacitor, including; a first

electrode 34; an insulator 29 located over said first electrode; and a second electrode 34 located over said insulator, wherein said first electrode 34 comprises a silicide.

Applicants assure us at page 7 of the remarks filed 10/8/07 that the single word "recrystallized," (which Applicants repeat 15 times in their claims) is simply a shorthand for "formed by depositing an amorphous layer and recrystallizing the same." Therefore, it is reasonable to say that Applicant's claims 2 and 3 do not distinguish over the Jung reference regardless of the process used to form first polysilicon layer 24b, because only the final product is relevant, not the recited process of depositing said layer as an amorphous layer and recrystallizing the same. See *SmithKline Beecham Corp. v. Apotex Corp.*, 78 USPQ2d 1097 (Fed. Cir, 2006 ("While the process set forth in the product-by-process claim may be new, that novelty can only be captured by obtaining a process claim.")

The Federal Circuit recently revisited the question of whether a "product by process" claim can be anticipated by a reference that does not recite said process. *SmithKline Beecham Corp. v. Apotex Corp.*, 78 USPQ2d at 1100. The Federal Circuit cited with approval this Office's current statement of the law, found in MPEP § 2113:

> [Even] though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

Id. at 1101. The Federal Circuit held this statement to be consistent with its own views on this topic, as well as various Supreme Court rulings, notably *Gen. Elec. Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 373 (1938) ("Although in some instances a claim may validly describe a new product with some reference to the method of production, a patentee who does not distinguish his product from what is old except by reference, express or constructive, to the

process by which he produced it, cannot secure a monopoly on the product by whatever means produced."). Id.

Note that when "product by process" claiming is used to describe one or more limitations of a claimed product, the limitations so described are limitations of the claimed product per se, no matter how said product is actually made. In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 161; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and In re Marosi et al., 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above case law makes clear. See also MPEP 706.03(e).

Regarding Claim 3, in Fig. 2l, Jung's first electrode 34 comprises cobalt silicide.

5. Claims 7, 8 and 19-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Amo et al. (2004/0129963)

Regarding Claims 7 and 8, in Figs. 2a and 2b, Amo et al. disclose a semiconductor device, comprising: a first polysilicon layer 208 located over a gate electrode layer 204; and a capacitor located on said first polysilicon layer 208, said capacitor, including; a first electrode 210; an insulator located 211 over said first electrode; and a second electrode 212 located over said insulator; wherein said gate electrode layer 204 is a second polysilicon layer and said first polysilicon layer 208 is located directly on said second polysilicon layer.

Applicants assure us at page 7 of the remarks filed 10/8/07 that the single word "recrystallized," is simply a shorthand for "formed by depositing an amorphous layer and recrystallizing the same." Therefore, it is reasonable to say that Applicant's Claims 7 and 8 does not distinguish over the Amo et al. reference regardless of the process used to form first polysilicon layer 208, because only the final product is relevant, not the recited process of depositing said layer as an amorphous layer and recrystallizing the same. See *SmithKline Beecham Corp. v. Apotex Corp.*, 78 USPQ2d 1097 (Fed. Cir, 2006 ("While the process set forth in the product-by-process claim may be new, that novelty can only be captured by obtaining a process claim.")

The Federal Circuit recently revisited the question of whether a "product by process" claim can be anticipated by a reference that does not recite said process. *SmithKline Beecham Corp. v. Apotex Corp.*, 78 USPQ2d at 1100. The Federal Circuit cited with approval this Office's current statement of the law, found in MPEP § 2113:

> [Even] though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

Id. at 1101. The Federal Circuit held this statement to be consistent with its own views on this topic, as well as various Supreme Court rulings, notably *Gen. Elec. Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 373 (1938) ("Although in some instances a claim may validly describe a new product with some reference to the method of production, a patentee who does not distinguish his product from what is old except by reference, express or constructive, to the process by which he produced it, cannot secure a monopoly on the product by whatever means produced."). Id.

Note that when "product by process" claiming is used to describe one or more limitations of a claimed product, the limitations so described are limitations of the claimed product per se, no matter how said product is actually made. In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 161; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and In re Marosi et al., 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above case law makes clear. See also MPEP 706.03(e).

Regarding Claim 8, Figs. 2a and 2b show that in Amo et al.'s semiconductor device polysilicon layer 208 forms at least a portion of a gate electrode stack

Regarding Claims 19-21, in Figs 2A and 12-16, Amo et al. disclose, transistors 204 located over a substrate 201, wherein at least one of said transistors includes a gate electrode stack comprising a polysilicon 208 layer located over a gate electrode layer 204; a capacitor located on said polysilicon layer, said capacitor including; a first electrode 210; an insulator 211 located over said first electrode; and a second electrode 212 located over said insulator; and an interlevel dielectric 207/209 layer located over said substrate, said interlevel dielectric layer having interconnects 1213 in Figs 12 and 13 and also in Fig. 11 located therein for contacting at least one of said gate electrode stack or said capacitor.

Applicant's Claims 19-21 do not distinguish over the Amo et al. reference regardless of the process used to form first polysilicon layer 208, because only the final product is relevant, not the recited process of depositing said layer as an amorphous layer and recrystallizing the same. See *SmithKline Beecham Corp. v. Apotex Corp.*, 78 USPQ2d 1097 (Fed. Cir, 2006 ("While the process set forth in the product-by-process claim may be new, that novelty can only be captured by obtaining a process claim.")

The Federal Circuit recently revisited the question of whether a "product by process" claim can be anticipated by a reference that does not recite said process. *SmithKline Beecham Corp. v. Apotex Corp.*, 78 USPQ2d at 1100. The Federal Circuit cited with approval this Office's current statement of the law, found in MPEP § 2113:

> [Even] though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

Id. at 1101. The Federal Circuit held this statement to be consistent with its own views on this topic, as well as various Supreme Court rulings, notably *Gen. Elec. Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 373 (1938) ("Although in some instances a claim may validly describe a new product with some reference to the method of production, a patentee who does not distinguish his product from what is old except by reference, express or constructive, to the process by which he produced it, cannot secure a monopoly on the product by whatever means produced."). Id.

Note that when "product by process" claiming is used to describe one or more limitations of a claimed product, the limitations so described are limitations of the claimed product per se, no matter how said product is actually made. In re Hirao, 190 USPQ 15 at 17 (footnote 3). See

also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 161; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and In re Marosi et al., 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above case law makes clear. See also MPEP 706.03(e).

Regarding Claim 20, at least a portion of Amo et al.'s first polysilicon layer 208 forms a portion of said first electrode 204.

Regarding Claim 21, Amo et al.'s transistors 204 are CMOS transistors.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jung (6,204,105) in view of Takemura (6,218,233).

Jung discloses a semiconductor device having all the limitations of claim 4 except the limitation of a surface roughness of 1-2 nm. However, Takemura discloses a semiconductor device where in Figs. 8-13, the required surface roughness is disclosed.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required surface roughness in Jung as taught by Takemura in order to have a capacitor structure with increased performance.

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jung (6,204,105) in view of Tu (6,642,097).

In Fig. 2l, Jung discloses a semiconductor device, comprising: a first polysilicon layer 24a/24b located over a gate electrode layer 34; and a capacitor located on said first polysilicon layer, said capacitor, including; first electrode 30a; an insulator located over said first electrode; and a second electrode located over said insulator 29; wherein at least a portion of said first polysilicon layer 24b forms a portion of said first electrode.

Applicants assure us at page 7 of the remarks filed 10/8/07 that the single word "recrystallized," is simply a shorthand for "formed by depositing an amorphous layer and recrystallizing the same." Therefore, it is reasonable to say that Applicant's claims 2 and 3 do not distinguish over the Jung reference regardless of the process used to form first polysilicon layer 24b, because only the final product is relevant, not the recited process of depositing said layer as an amorphous layer and recrystallizing the same. See *SmithKline Beecham Corp. v. Apotex Corp.*, 78 USPQ2d 1097 (Fed. Cir, 2006 ("While the process set forth in the product-by-process claim may be new, that novelty can only be captured by obtaining a process claim.")

The Federal Circuit recently revisited the question of whether a "product by process" claim can be anticipated by a reference that does not recite said process. *SmithKline Beecham Corp. v. Apotex Corp.*, 78 USPQ2d at 1100. The Federal Circuit cited with approval this Office's current statement of the law, found in MPEP § 2113:

> [Even] though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

Id. at 1101. The Federal Circuit held this statement to be consistent with its own views on this topic, as well as various Supreme Court rulings, notably *Gen. Elec. Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 373 (1938) ("Although in some instances a claim may validly describe a new product with some reference to the method of production, a patentee who does not distinguish his product from what is old except by reference, express or constructive, to the process by which he produced it, cannot secure a monopoly on the product by whatever means produced."). Id.

Note that when "product by process" claiming is used to describe one or more limitations of a claimed product, the limitations so described are limitations of the claimed product per se, no matter how said product is actually made. In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 161; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and In re Marosi et al., 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above case law makes clear. See also MPEP 706.03(e).

Jung fails to disclose the required final thickness for the polysilicon layer. However, Tu discloses a capacitor structure where in Fig. 1, polysilicon layer 32 has a thickness of around 30 nm.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required thickness for the polysilicon layer in Jung as taught by Tu, in order to have a semiconductor device with smaller geometry.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to FAZLI ERDEM whose telephone number is (571)272-1914. The examiner can normally be reached on M - F 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue Purvis can be reached on (571) 272-1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

FE

January 26, 2009

/Sue A. Purvis/

Supervisory Patent Examiner, Art Unit 2826